ABSTRACT

DISSERTATION TITLE: Management of Gingival hyperpigmentation using Diode laser and CO_2 laser therapy: A comparative study.

BACKROUND:

A smile expresses a feeling of joy, success, sensuality, affection, and courtesy and can reflect self-confidence and kindness. The aesthetic needs of the patients are increasing day by day. Each and every patient wants a beautiful smile.The pigmentation of the gingiva, when it is not related to the skin complexion, is a dampening factor in an otherwise acceptable smile window. In recent years, the use of laser photoablation has been recognized as one of the most effective, pleasant, and reliable techniques for treatment of gingival hyperpigmentation. Different lasers have been used for gingival depigmentation, including carbon dioxide (CO_2) (10,600 nm), diode (820 nm), neodymium-doped:yttrium, aluminium, and garnet (Nd:YAG) (1,064 nm), erbium (Er-doped:YAG) (2,940 nm), and erbium- and chromium-doped:yttrium, scandium, gallium, garnet (Er,Cr:YSGG) (2,780 nm) lasers. This study compares the efficiency of carbon dioxide (CO_2) and diode laser techniques to change the colour of the gingiva in the treatment of gingival hyperpigmentation by assessing the colour of the gingiva, gingival bleeding, operator's difficulty, post operative wound healing, pain and esthetic perception by the patient at 1 week,2 week,3 week and 4 week post-operatively.

MATERIALS AND METHODS:

This double-blinded study was conducted at Department of oral and maxillofacial surgery, Rajas dental college and hospital, Tirunelveli from February 2013 to November 2015. Ten patients requiring gingival depigmentation were selected from pool of a patients reporting to

TheRajas dental college.The patient was blinded about the type of laser used for depigmentation of his/her gingiva. Gingival depigmentation was done from canine to canine in the upper anterior region.A total of 20 anterior segments were treated: 10 randomly to Carbon dioxide & Diode Laser group using Flip coin method. Pre-operative photographs & Post operative radiographs were obtained with a digital camera with standardized settings for grey, white, black and a cm scale with standard lighting and backdrop. Macroscopic distribution and colour of the pigmentation of all surfaces were recorded in detail. A single surgeon performed the procedure in each segment using diode or CO_2 laser as allocated by the co-investigator. The primary investigator who was blinded about the allocation of segment evaluated the primary or secondary parameters like colour of the gingival, bleeding, difficulties of the operator, pain perception of patient and post-operative wound healing. The parameters were evaluated intra- operatively and post-operatively till 4^{th} week of follow-up.

DATA ANALYSIS:

The collected patient data were tabulated and statistical analysis were performed. Microsoft Excel 2010 software to derive the mean and standard deviation and SPSS software version 21 was used for statistical analysis. Charts and graphic representations were obtained with the results. Descriptive statistics done by Measures of central tendency E.g. Mean and Measures of Dispersion E.g. Standard deviation was calculated for all the parameters. Inferential Statistics was done by unpaired student 't' test to compare the mean difference between the two groups for difference in the colour of the gingival, bleeding, difficulties of the operator, pain perception of patient and post-operative wound healing.P value of 5% was considered significant.

RESULTS AND STATISTICS:

A total of 10 patients were selected for treatment of gingival hyperpigmentation. Out of 10 patients in the study group 6 were males and 4 were females. Pre-operatively,in both the study group, the colour of the gingiva was heavy. The results of this study shows that the degree of pigmentationat the end of 4^{th}week wasless in diode group with 20% of the patient showing no pigmentation compared to CO_2group (10%). Unpaired student't' test was done to assess the difference in colour of gingiva pre and post-operatively.There was slight statistical significance between the two groups in the colour of the gingival (p value=0.047*).Regarding difficulty of the operator and pain and wound healing, there was no statistical significant difference between the diode and CO_2group (p value=$1,000^{NS}$).In case of bleeding, there was marginally significant difference between the diode and CO_2group (p value=0.0632^{+}) in the immediate post-operative period. With regards to esthetic perception by the patient, there was marginally significant difference between the diode and CO_2group (p value=0.0632^{+}) at the end of 4^{th} week. Regarding the aesthetic consideration diode laser group scored more satisfaction than CO_2 laser study group.

SUMMARY AND CONCLUSION:

Growing aesthetic need requires the removal of hyperpigmented areas to create pleasant and confident smile which altogether alter personality of an individual. From our study we come to the conclusion that on comparing both the group diode laser study group had better outcome than CO_2 laser study group.

KEYWORDS: Diode laser, Carbon dioxide laser, Hyper-pigmentation, De-pigmentation, melanin, Esthetics.